TOBACCO INDUSTRY RESEARCH COMMITTEE

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Study of the Effect of Tobacco Tar on the White Pekin Duck

During 1958 and 1959 we completed a group of experiments in which tobacco tar in mineral oil was put into the trachea of white Pekin ducks. This was accepted for publication by the Archives of Pathology in June, 1959; however, it has not as yet been published. The title of this paper is "The Effect of Tobacco Condensate on the Respiratory Tract of White Pekin Ducks." No tumors occurred in the respiratory tract following the intratracheal injection of tobacco tar.

Using the same technique as with the tobacco tar, we put methylcholanthrene in mineral oil into the respiratory tract of white Pekin ducks. Extensive metaplasia occurred in the trachea but no squamous cell carcinomas occurred. The same controls, using only mineral oil, and the trachea from normal ducks were used for both the methylcholanthrene and tobacco tar experiments. This latter experiment was published in the Archives of Pathology in November, 1959. The title was "Effects of Methylcholanthrene on the Respiratory Tract of White Pekin Ducks."

With the knowledge that methylcholanthrene could be suspended in Tween 80, we have carried out a series of experiments during the past year comparing the effect of different amounts of methylcholanthrene on the respiratory tract. This experiment is still in progress. However, a large number of neoplasms, both carcinomas and sarcomas, already have occurred in the respiratory tract of these ducks. Tween 80 given in equal amounts has not produced any tumors so far.

This phase of the study of the effect of methylcholanthrene on the respiratory tract, as far as I know now, will be completed by June, 1960. An exhibit, showing the experimental production of pulmonary neoplasms in the white Pekin duck, was shown at the meeting of the Southern Medical Association in Atlanta, Georgia, in November, 1959. During the presentation of this exhibit the question of cancer and tobacco frequently arose. Our experimental observations in the duck were discussed.

During our studies with methylcholanthrene, we have observed the occurrence of amyloidosis; also, three of the ducks previously treated with tobacco tar developed amyloidosis. In September, 1959, we began treating a group of ducks daily with tobacco tar suspended in Tween 80 (3 ml. tar and 27 ml. of a 1% solution of Tween 80). One milliliter is given intratracheally daily for five days each week. This experiment is now in progress and will be continued for about two more months. The ducks then will be observed for a year, at which time they will be killed and autopsied. This will give us an additional number of ducks given tobacco tar intratracheally and, too, it will give us an opportunity to determine whether amyloidosis has occurred in this group of birds given the tobacco tar.

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At the present time I am questioning the occurrence of amyloid as related to either methylcholanthrene or tobacco tar. This is due to the finding of amyloid in two ducks that did not receive either methylcholanthrene or tobacco tar. This phase of the problem of amyloidosis is being carefully studied at the present time.

We are now setting up an experiment in which the polycyclic hydrocarbons anthracene and phenanthrene will be put into the trachea of the duck. These birds will be observed for a year. The results of this experiment will be compared with methylcholanthrene and tobacco tar studies. I would like to continue studying the effect of other chemical carcinogens on the respiratory tract of the white Pekin duck during the next several years. With the technique we now have developed, I believe it will be profitable to investigate the effect of other agents on the respiratory tract. Our observations so far in the duck indicate that the relation of metaplasia to neoplasms is not a simple straightforward one. This approach may be productive for additional information on neoplasia.

In another study, supported by the National Cancer Institute, we are comparing the effects of methylcholanthrene on different tissues of the duck. Methylcholanthrene pellets have been put into the brain, muscle and abdominal cavity. We are now comparing the effects of methylcholanthrene given orally with those resulting from intratracheal injections. These studies will show whether or not a carcinogenic agent will always produce a neoplasm in all tissues of the same host.

This report will give you some indication of the progress of our experimental studies supported by funds from the Tobacco Industry Research Committee.

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